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Commonwealth of Massachusetts.

State Board of Health, Lunacy and Charity,
Department of Health, 13 Beacon Street,
Boston, February, 1886.

Milk of Known Purity.

The following observations have been made under the direction of the Health Department of the State Board of Health, Lunacy and Charity, with reference to the quality of milk as produced by herds, and by single animals in the State of Massachusetts. The term "known purity" is used to designate such milk as has been obtained by the inspectors, or other authorized agents of the Board, each sample having been procured by them at the dairies, or stables where the milk was produced, the agents or inspectors being required to witness the milking of each animal, whose product was submitted to analysis.

The analyses were made at the Laboratories of the Harvard Medical College and of the Massachusetts Agricultural College by the analysts of the Board, Professors C. A. Goessmann and Charles Harrington.

For convenience of reference the samples are classified; Table 1 including the milk of single animals, each sample representing an average specimen of the whole quantity of milk produced at a single milking.

Table 2 contains the results of analysis of the mixed milk of herds or dairies; each sample representing the milk obtained at one milking from two or more animals. The total number of samples of this sort was 54, obtained from an

aggregate of 386 animals, being an average of 7 in each herd or dairy.

The results are still further classified with reference to the source of production; the milk produced at the farms of public institutions being tabulated separately from that produced at private farms or dairies.

The following items are given in the tables herewith presented: —

1. The time of year and also of the day.
2. The place where the sample was obtained or produced.
3. Age of animal. *
4. Time since calving. *
5. Breed.
6. Character of feed.

Results of Analysis.

7. Fat.
8. Solids, not fat.
9. Total solids.
10. Water.
11. Ash.
12. Averages of herds or dairies.

Table III. is introduced for the purpose of showing the number and percentage of animals included in Table I. with reference to the quality of their milk as compared with the minimum requirement of the Public Statutes.

The summary of these results is as follows: —

Samples obtained from single animals supplying public institutions, ...	116
Samples obtained from single animals at private farms, ...	95
Total of samples from single animals, . . .	211†
Total number of animals represented in Table I., .	209

* In Table II. these columns are omitted and a column giving the *number of animals* is substituted

† In one instance three samples were taken from one animal in order to determine the difference in quality between different fractional parts of a single milking.

Mixed samples obtained from public institutions,	9
" " " " private farms,	45
Total number of samples of mixed milk,	54
" " animals represented in Table II.,	386
Average number of animals in each herd,	7
Average solids of samples from single animals in public institutions,	13.04
Average solids of samples from single animals at private farms,	13.43
Average solids of all samples from single animals,	13.21
Average solids of samples of mixed milk from public institutions,	12.92
Average solids of samples of mixed milk from private farms or dairies,	13.35
Average solids of all samples of mixed milk,	13.28
Average solids of all samples of milk obtained from public institutions, mixed and single, (175 animals),	13.00
Average solids of all samples of milk obtained from private farms, mixed and single (426 animals),	**13.36**
Average solids of all samples of mixed milk and milk of single animals from all sources,	13.26
Total number of animals producing the same,	601

It is evident that the figures given in the column entitled Dairy Averages may differ slightly from the result obtained where the entire milk of the same number of animals is mixed, and a sample of the mixture submitted to analysis, for the following reason.

The mathematical result is obtained by adding the total solids, and dividing the sum by the number of animals. The error of this method may be illustrated as follows:

The average of two pint samples of milk taken from two animals, one giving four quarts of milk containing 14 per cent. of total solids, at a milking, and the other giving eight quarts of milk containing but 12 per cent. of total solids would evidently be 13 per cent. of solids. If, on the other hand, the

entire milk of the two animals be mixed, a sample of the mixture would give but 12.67 per cent. of solids.

This difference diminishes as larger numbers are considered, and in the case of large herds, or aggregates of herds, may be practically ignored.

In Table IV. the samples of milk are classified with reference to the breed of the animals from which they were obtained. Samples from grade cows are not included in this table.

The samples represented in the following tables were produced by animals owned in eight different counties of the State, including the two largest milk-producing counties (Middlesex and Worcester), and considering the varying conditions of production, such as breed, age, time of day, and season of the year, character of feed, and other modifying circumstances, the result obtained — 13 36 per cent. of total solids — may be fairly considered as an average of the present milk-product as furnished by the 150,000 milch cows of Massachusetts.

The difference in quality of the milk obtained from public institutions cannot materially affect this result, since the ratio of animals owned by them is less than one per cent. of the entire number in the State.

SAMUEL W. ABBOTT,
Health Officer.

TABLE No. 1. — *Milk of Single Animals — Public Institutions.*

TIME OF YEAR.	Where Obtained.	Age of Cow.	Time since Calving.	Breed.	Character of Feed.	Fat.	Solids, not Fat.	Total Solids.	Water.	Ash.	Dairy Averages.
1884.											
April, . . .	State Institution No. 1,	–	–	–	– – –	3.20	9.81	13.01	86.99	–	–
" . . .	" " " .	–	–		– – –	4.95	9.41	14.36	85.64	–	–
" . . .	" " " .	–	–	–	– – –	5.90	9.06	14.96	85.04	–	–
November, . .	" " " .	7 years.	–	–	Each cow received 2 qts corn meal, 4 qts. shorts, 2 qts. cotton-seed meal, about a bushel of ensilage, and good English hay,	5.53	9.16	14.69	85.31	0.63	–
" . .	" " " .	19 months.	5 weeks,	–	" " "	2.91	9.07	11.98	88.02	0 68	–
" . .	" " " .	6 years.	-	–	" " "	3.35	9.51	12.86	87.14	0.66	–
" . .	" " " .	6 "		–	" " "	5.22	9.02	14.24	85.76	0.74	–
" . .	" " " .	4 "	–	–	" " "	4.49	10.03	14.52	85.48	0.72	–
" . .	" " " .	3 "	–	–	" " "	4.67	10.04	14.71	85 29	0.69	–
" . .	" " " .	4 "	–	–	" " "	4.32	10.18	14.50	85.50	0.67	–
" . .	" " " .	9 "	–	–	" " "	4.19	9.05	13.24	86.76	0.66	–
" . .	" " " .	10 "	–	–	" " "	4.09	10.01	14 10	85.90	0 76	–
" . .	" " " .	10 "	–	–	" " "	3.63	9.21	12.84	87.16	0.63	–
" . .	" " " .	5 "	–	–	" " "	3.03	9.24	12.27	87 73	0.66	–
" . .	" " " .	5 "	–	–	" " "	6.06	8.57	14.63	85.37	0.54	–
" . .	" " " .	6 "	–	Jersey, –	" " "	5.24	9.90	15.14	84.86	0.75	–

TABLE No. 1 — *Continued.*

TIME OF YEAR.	Where Obtained.	Age of Cow.	Time since Calving.	Breed.	Character of Feed.	Fat.	Solids, not Fat.	Total Solids.	Water.	Ash.	Dairy Averages.
1884. November, . .	State Institution No. 1,	12 years.	–	–	Each cow received 2 qts. corn meal, 4 qts. shorts, 2 qts. cotton-seed meal, about a bushel of ensilage, and good English hay,	4.25	10.20	14 45	85.55	0.67	–
" . .	" " " .	5 "	–	–	" " "	4 64	10.62	15 26	84.74	0 78	18 samples, 13.80
May, . . .	State Institution No. 2,	5 "	5 months,	Holstein,	Hay, shorts and cotton-seed meal,	3.56	9.10	12.66	87 34	0.71	–
" . . .	" " " .	5 "	6 weeks,	"	" " " .	3.39	8 05	11.44	88 56	0.74	–
" . . .	" " " .	5 "	3½ months,	"	Ensilage, shorts and cotton-seed meal,	4.07	9.01	13.08	86.92	0.72	–
" . . .	" " " .	8 "	4 "	Durham,	" " "	3.71	8.17	11.88	88.12	0.68	–
" . . .	" " "	7 "	3 "	"	" " "	4.16	8.66	12.82	87.18	0.66	–
" . . .	" " " .	5 "	5 "	Holstein,	Hay, shorts and cotton-seed meal,	3.68	9.26	12 .94	87.06	0 71	–
" . . .	" " " .	5 "	6 weeks,	" *	" " " .	3.61	8 80	12 41	87.59	0.64	–
" . . .	" " " .	5 "	3½ months	" *	Ensilage, shorts and cotton meal,	4.56	9.09	13 65	86 35	0.73	
" . . .	" " " .	8 "	4 "	Durham,	" " "	3.36	8.72	12.08	87.92	0.68	–
" . . .	" " " .	7 "	3 "	"	" " "	4.92	8.44	13 36	86.64	0.76	–
" . . .	" " " .	5 "	12 weeks,	Holstein,	Ensilage and hay, . . .	2.93	8.74	11.67	88.33	0.69	
" . . .	" " " .	5 "	17 "	"	" " . . .	4.36	8 02	12.38	87.62	0 69	

* Spayed four weeks before.

" . . .	" " " .	9	6 "	Native,	" " . . .	4.37	8.53	12.90	87.10	0.69	-
" . . .	" " "	7 "	15 "	Holstein,	" " .	3.55	8.93	12.48	87.52	0.64	-
" . . .	" " " .	7 "	18 "	Durham,	" " . .	3.36	8.74	12.10	87.90	0.69	{ 15 samples, 12.53
October, . .	State Institution No. 3,	-	3¼ "	Jersey,	Cut hay, corn meal and shorts,	2.05	10.43	12.48	87.52	0.72	-
" . .	" " " .	-	19 months,	Dutch,	" " "	4.77	10.58	15.35	84.65	0.73	-
" . .	" " " .	-	3 "	Ayrshire,	" " "	3.01	8 84	11.85	88.15	0.65	-
" . .	" " " .	-	6 "	Native,	" " "	3.08	8.98	12.06	87.94	0.65	-
" . .	" " " .	-	1 month,	Devon,	" " "	3.66	10.69	14.35	85.65	0.70	-
" . .	" " " .	-	-	Native,	" " "	3.81	9.96	13.77	86.23	0.71	-
" . .	" " " .	-	2 months,	Durham,	" " "	4.39	11.28	15.67	84.33	0.77	-
" . .	" " " .	-	6 "	{ Grade Jersey,	" " "	1.24	9.80	11.04	88.96	0.79	{ 8 samples, 13.32
November, . .	State Institution No. 4,	7 years	6 "	Mixed,	Shorts and hay, ...	4.67	10.13	14.80	85.20	0.74	-
" . .	" " " .	9 "	4 "	Durham,	" "	2.80	9 04	11.84	88.16	0.70	-
" . .	" " " .	5 "	6 "	Dutch,	" "	4.67	10.25	14.92	85.08	0.75	-
" . .	" " " .	7 "	12 "	Dutch,	" "	3.90	8.40	12.30	87.70	0.68	-
" . .	" " " .	6 "	5 "	Mixed,	" "	3.65	9.23	12.88	87.12	0.69	-
" . .	" " " .	8 "	6 "	Durham,	" "	3 67	9.92	13 59	86.41	0.70	-
" . .	" " " .	6 "	7 "	Devon,	" "	4.17	10.94	15.11	84.89	0.75	-
" . .	" " " .	9 "	6 "	Durham,	" "	2.88	9.69	12.57	87.43	0.69	-
" . .	" " " .	6 "	4 "	Mixed,	" "	3.45	9.24	12 69	87.31	0.67	-
" . .	" " " .	8 "	5 "	Ayrshire,	" "	3.02	9.50	12.52	87.48	0.61	-
" . .	" " " .	7 "	6 "	Durham,	" "	2.76	9 56	12 32	87.68	0.63	-

TABLE No. 1 — *Continued.*

TIME OF DAY AND YEAR.	Where Obtained.	Age of Cow.	Time since Calving.	Breed.	Character of Feed.	Fat.	Solids, not Fat.	Total Solids.	Water.	Ash.	Dairy Averages.
1884.											
November, . .	State Institution No. 4,	9 years,	3 months,	Durham,	Shorts and hay, . . .	4.02	9.37	13.39	86.61	0.74	–
" . .	" " " .	8 "	6 "	"	" " . . .	3.11	9.16	12.27	87.73	0.71	–
" . .	" " " .	7 "	4 "	Mixed,	" " . . .	4.24	9.52	13.76	86.24	0.65	–
" . .	" " " .	5 "	6 "	Devon,	" " . . .	5.12	10.92	16.04	83.96	0.77	–
" . .	" " " .	8 "	8 "	Mixed,	" " . . .	4.05	10.68	14.73	85.27	0 74	16 samples, 13.48
May 30 (A. M.), .	State Institution No. 5,	6 "	7 "	Half Holstein,	Grass, meal, ...	3.56	9.73	13.29	86.70	–	–
" " .	" " " .	10 "	1 "	Durham and Ayrshire.	Shorts with hay, . . .	5.72	–	12.42	87.56	–	–
" " .	" " " .	13 "	1 "	Ayrshire,	" " . . .	4.92	–	11.66	88.34	–	–
" " .	" " " .	2 "	4 "	"	" " . . .	2.57	–	13.04	86.96	–	–
" " .	" " " .	5 "	1 "	"	" " . . .	3.14	–	14.63	85.37	–	–
" " .	" " " .	4 "	1 "	"	" " . . .	4.01	–	13.38	86.62	–	–
June 6 (A. M.), .	" " " .	6 "	8 "	Half Holstein,	Grass, shorts with hay, . .	4.06	–	13.30	86.70	–	–
" " .	" " " .	10 "	2 "	Durham and Ayrshire.	" " " . .	2.83	–	11.14	88.86	–	–
" " .	" " " .	13 "	1 "	Ayrshire,	" " " . .	2.86	–	11.53	88.47	–	–
" " .	" " " .	2 "	5 "	"	" " " . .	3.58	–	12.68	87.32	–	–

" " .	" " " .	5 "	1 "	"	" " " .	4.00	–	13.40	86.60	–	–
" " .	" " " .	4 "	1 "	"	" " " .	3.22	–	12.21	87.79	–	12 samples, 12.71
August 8 (P. M.),	State Institution No. 6,	8 years,	6 months,	Grade Durham,	Grass and corn fodder, . .	3.67	8.69	12.36	87.64	–	–
" " .	" " " .	9 "	6 weeks,	" "	2 qts. meal, grass and corn fodder,	3.27	8.46	11.73	88.27	–	–
" " .	" " " .	8 "	2 months,	" "	Grass and corn fodder, . .	2.30	8.42	10.72	89.28	–	–
" " .	" " " .	9 "	5½ "	" "	4 qts. meal, grass and corn fodder,	3.33	8.47	11.80	88.20	–	–
" " .	" " " .	7 "	6⅓ "	Devon, .	Grass and corn fodder, . .	3.89	9.20	13.09	86.91	–	–
" " .	" " " .	7 "	3 "	Grade Durham,	" " . .	3.12	8.30	11.42	88.58	–	–
" 15 (P. M.),	" " " .	10 "	2 "	" "	3 qts. meal, grass and corn fodder,	3.15	8.71	11.86	88.14	–	–
" " .	" " " .	10 "	8 "	" "	4 qts. meal, grass and corn fodder.	3.47	9.34	12.81	87 13	–	–
" " .	" " " .	10 "	5 "	" "	3 qts. meal, pasture and corn fodder,	3.51	8.80	12.31	87.69	–	–
" " .	" " " .	8 "	7 "	" "	Grass and corn fodder, . .	4.21	9.04	13.25	86.75	–	–
" " .	" " " .	8 "	5 "	" "	" " . .	3.61	8.47	12 08	87.92	–	–
" " .	" " " .	4 "	2½ "	Thoroughbred Durham,	3 qts. meal, grass and corn fodder,	3.28	8.85	12.13	87.87	–	12 samples, 12.13
1885.											
Sept. (4 P. M.), .	State Institution No. 7,	10 "	8 "	Ayrshire and Jersey,	Pasturage and 4 qts. meal per day,	3.82	10.27	14.09	85.91	.71	–
" " .	" " " .	10 "	10 "	" "	" " "	4.69	11.09	15.78	84.22	.68	–
" " .	" " " .	10 "	6 "	Native, .	" " "	3.83	10.60	14.43	85 57	.70	–

TABLE No. 1 — *Continued.*

TIME OF DAY AND YEAR.	Where Obtained.	Age of Cow.	Time since Calving.	Breed.	Character of Feed.	Fat.	Solids, not Fat.	Total Solids.	Water.	Ash.	Dairy Averages.
1885.											
Sept. (4 P. M.),	State Institution No. 7,	10 years.	18 months,	Ayrshire and Jersey,	Pasturage and 4 qts. meal per day,	3.53	10.78	14 31	85.69	.69	-
" "	" " "	6 "	16 "	"	" " "	3.31	11.19	14.50	85.50	.63	-
" "	" " "	10 "	7 "	Durham,	" " "	4.06	10.11	14.17	85.83	.70	-
" "	" " "	6 "	5 "	Ayrshire and Jersey,	" " "	4.30	9.86	14.16	85.84	.70	
" "	" " "	6 "	10 "	Ayrshire and Native,	" " "	3.01	10.39	13.40	86.60	.70	-
" "	" " "	12 "	4 "	Native,	" " "	3.87	10 52	14.39	85.61	.70	
" "	" " "	6 "	3 "	"	" " "	3.10	10.14	13.24	86.76	.65	-
" "	" " "	7 "	3 "	"	" " "	2.21	10 25	12.46	87.54	.65	11 samples, 14.09
Nov. (5 P. M.),	State Institution No. 8,	4 "	3 "	"	Hay, shorts and meal,	3.30	8.75	12.05	87.95	.56	-
" "	" " "	4 "	3 weeks,	"	" "	3.58	9.19	12.77	87 23	.56	-
" "	" " "	4 "	3 "	"	" "	3.14	9.15	12.29	87 71	.50	
" "	" " "	5 "	2 "	"	" "	3.23	9.46	12.69	87 31	.58	-
" "	" " "	6 "	3 "	"	" "	1 92	9.03	10.95	89.05	58	-
" "	" " "	2 "	6 "	Holstein,	" "	1.87	9 02	10.89	89.11	.65	-
" "	" " "	"	6 months,	Native,	" "	4.07	9 24	13.31	86.69	.61	-

"	"	"	"	"	5	"	5	"	"	"	"	3.10	9.56	12.66	87.34	.68	8 samples, 12.20
"	(5.30 A. M.)	State Institution No. 9,			5	"	6	"	Alderney,	Hay, shorts, meal and roots,		3.97	9 53	13.50	86.50	.68	-
"	"	"	"	"	10	"	6	"	Ayrshire,	"	"	4.49	10.71	15.20	84.80	.70	-
"	"	"	"	"	3	"	3	"	"	"	"	2 71	9.31	12.02	87.98	.62	-
"	"	"	"	"	16	"	24	"	"	"	"	3 00	9.85	12.85	87.15	.61	-
"	"	"	"	"	8	"	6	"	Alderney,	"	"	4.08	9.89	13.97	86.03	.68	-
"	"	"	"	"	14	"	8	"	Ayrshire,	"	"	3.51	9.92	13.43	86.57	.64	-
"	"	"	"	"	9	"	3	"	"	"	"	2.89	8 37	11.26	88.74	.55	-
"	"	"	"	"	16	"	12	"	"	"	"	2.80	9.08	11.88	88.12	.68	-
"	"	"	"	"	3	"	5	"	Jersey & Swiss,	"	"	3.90	9.81	13.71	86.29	.64	-
"	"	"	"	"	7	"	2	"	Ayrshire,	"	"	2.44	9.67	12.11	87.89	.60	-
"	"	"	"	"	12	"	10	"	"	"	"	2 20	9.21	11.41	88.59	.64	-
"	"	"	"	"	8	"	3	"	Jersey,	"	"	4.36	9 65	14.01	85.99	.64	-
"	"	"	"	"	10	"	3	"	Ayrshire,	"	"	3.07	9.31	12.38	87.62	.66	-
"	"	"	"	"	3	"	4	"	"	"	"	3.09	9.66	12.75	87.25	.67	-
"	"	"	"	"	3	"	3	"	Swiss and Ayrshire,	"	"	2 35	9.17	11.52	88.48	.54	-
"	"	"	"	"	3	"	3	"	Ayrshire,	"	"	2.83	8.84	11.67	88.33	.65	16 samples, 12.73

Average of single samples of Public Institutions, . 13.04

TABLE No. 1 — *Milk of Single Animals — Private Farms and Dairies.*

TIME OF DAY AND YEAR.	Where Obtained.	Age of Cow.	Time since Calving.	Breed.	Character of Feed.	Fat.	Solids, not Fat.	Total Solids.	Water.	Ash.	Dairy Averages.
1884.											
April, . . .	Medford (Middlesex county),	–	8 months,	–	Brewers' grains, . . .	3.84	9.57	13.41	86.59	0.68	–
" . . .	" " " .	–	3 weeks,	–	" " . . .	3.27	9.15	12.42	87 58	0.75	–
" . . .	" " " .	–	21 months,	–	" " . . .	3.35	10.03	13.38	86.62	0.76	–
November, . .	Lowell (private farm, Middlesex county),	5 years,	–	Durham, .	Each cow fed as follows, 1 qt. rye meal, 2 qts. cotton-seed meal, 3 qts. shorts and cabbage leaves,	2.60	9.40	12.00	88.00	0.69	–
" . .	" " "	5 "	–	"	" " " "	3.29	9.27	12.56	87.44	0.66	–
" . .	" " " .	8 "	–	"	" " " "	2.80	8.45	11.25	88.75	0.51	–
" . .	" " " .	7 "	–	"	" " " "	5.00	9.21	14.21	85.79	0.59	–
" . .	" " " .	8 "	–	"	" " " "	2.69	8.99	11.68	88.32	0.62	–
" . .	" " " .	5 "	–	"	" " " "	2.64	9.57	12.21	87.79	0.68	–
" . .	" " " .	6 "	–	"	" " " "	3.01	9.45	12.46	87.54	0.61	–
" . .	" " " .	7 "	–	Native, .	" " " "	4.10	9.60	13.70	86 30	0.62	–
" . .	" " " .	9 "	–	"	" " " "	3.24	9.09	12.33	87.67	0.60	–
" . .	" " " .	7 "	–	"	" " " "	2.73	11.04	13.77	86.23	0.70	–
" . .	" " " .	5 "	–	"	" " " "	3.76	9.69	13.45	86.55	0.69	–
" . .	" " " .	7 "	–	"	" " " "	3.90	10.04	13.94	86.06	0.66	–
" . .	" " " .	7 "	–	"	" " " "	4.64	9 25	13.89	86.11	0.68	13 samples, 12.88

April, 1884, .	Taunton (Bristol Co.),	-			Jersey. Samples representing different periods of the same milking.	"Fore milk,"	3.88	9.46	13.34	86.66	0.85	-
" . .	" " " .	-				"Middle,"	6.74	8.66	15.40	84.60	0.81	-
" . .	" " " .	-				"Strippings,"	8.12	9.01	17.13	8 .87	0.82	-
" . .	Swill milk farm, Medford (Middlesex county),	From one cow				Brewers' grains, tomato skins, cauliflower stumps, a little meal and salt hay,	3.17	10.42	13.59	86.41	-	-
August, . .	" " " .	From best cow, ...				"	3.15	10.32	13.47	86.53	-	-
" " .	" " " .	From one cow (very lean), . .				"	3.31	9.68	12.99	87.01	-	-
" " .	" " " .	Cow 20 years old (no teeth), . .				"	2.79	10.18	12.97	87.03	-	-
1885.												
Aug. (5.30 A. M.),	Swansea, (Bristol county),	3 years,		4 months,	Holstein,	Middlings, shorts, corn stalks and green oats,	-	-	12.20	87.80	0 55	-
" " .	" " "	2 "		5 "	"	" " " "	3.43	8.92	12.35	87.65	0.60	-
" " .	" " " .	2 "		4 "	"	" " " "	2.33	9.49	11.82	88.18	0.60	-
" " .	" " " .	2 "		4 "	"	" " " "	1.96	8.38	10.34	89.66	0.60	-
" " .	" " " .	2 "		$5\frac{1}{2}$ "	"	" " " "	3.13	9.64	12.67	87.33	0.60	-
" " .	" " " .	2 "		3 "	"	" " " "	2.39	9.75	12 14	87.84	0.56	
" " .	" " " .	6 "		3 "	"	" " " "	3.27	8.67	11 94	88.06	0.56	-
" " .	" " " .	3 "		$2\frac{1}{2}$ "	"	" " " "	3.46	9.09	12.55	87.45	0.50	8 samples, 12 00.
" " .	Hardwick, (Worcester county),	10 "		$4\frac{1}{2}$ "	"	Pasturage, ...	3.36	8.73	12 09	87.91	0.62	-
" " .	" " " .	4 "		4 "	"	"	3.26	8.93	12.19	87.81	0.58	3 samples, 12.44.
" " .	" " " .	5 "		4 "	"	"	3.70	9.35	13.05	86.95	0.66	
Sept. (5 P. M.),	Grafton (Worcester county),	7 "		2 "	Grade Ayrshire,	Pasturage, rowen, 6 qts. middlings,	3.26	9.32	12.58	87.42	0.62	11 Holsteins, 12.12

TABLE No. 1 — *Continued.*

TIME OF YEAR.	Where Obtained.	Age of Cow.	Time since Calving.	Breed.	Character of the Feed.	Fat	Solids, not Fat	Total Solids.	Water,	Ash.	Dairy Averages.
1884. Sept (5 P. M.) .	Grafton (Worcester county),	8 years.	10 months.	Grade Dutch,	Pasturage, rowen, 6 qts. middlings,	5.64	10.43	16.07	83.93	0.74	-
" " .	" " " .	8 "	11 "	Grade Jersey,	" " " "	2.09	11.36	13.45	86 55	0.73	-
" " .	" " " .	8 "	3½ "	Grade Devon,	" " " "	1.49	10.59	12.08	87.92	0.52	-
" " .	" " " .	7 "	14 "	Grade Jersey,	" " " "	4.21	10 21	14.42	85 58	0.67	-
" " .	" " " .	6 "	6 "	" "	Pasturage, rowen, oats and corn,	2.30	10.91	13.21	86.79	0.57	
" " .	" " " .	6 "	5 "	Durham and Ayrshire,	" " " "	2.81	9.87	12.68	87.32	0.62	-
" " .	" " " .	2 "	1 "	Grade Jersey,	" " " "	3 31	10.16	13.47	86.53	0.64	8 samples, 13.50.
5.30 A. M. . .	Littleton (Middlesex county),	8 "	25 days,	Ayrshire and Durham,	4 qts. shorts and 2 qts. gluten meal and pasturage.	2 79	10.17	12.96	87.04	0.77	-
" . .	" " " .	6 "	11 weeks,	Ayrshire and Jersey,	" " " "	3.61	10.05	13.66	86.34	-	-
" . .	" " " .	6 "	4½ months,	Ayrshire,	" " " "	3.22	9.67	12.89	87.11	0.60	-
" . .	" " " .	2½ "	4 weeks,	Ayrshire and Jersey,	" " " "	2.68	9.89	12.57	87.43	0.58	-
" . .	" " " .	4 "	7½ months,	Ayrshire,	" " " "	4.13	11.24	15.37	84.63	0 60	
" . .	" " " .	6 "	5½ "	"	" " " "	2.73	10.28	13 01	86.99	0.61	-
" . .	" " " .	4 "	11 weeks,	"	Shorts and middlings, . .	5.04	10.63	15.67	84.33	0.57	-

"	" " " .	6 "	6½ months,	"	" " . .	3.83	10.78	14.61	85.39	0.61	-
" . .	" " " .	5 "	7 days,	Durham,	" " . .	4.54	11.77	16.31	83.69	0.75	9 samples, 14 12.
October (5 P. M.),	Woburn (Middlesex county),	3 "	6 months,	Native,	Hay, shorts and cotton-seed meal,	3.98	10.93	14 91	85.09	0.72	-
" " .	" " " .	8 "	8 "	"	" " "	4.24	10.22	14.46	85.54	0.66	-
" " .	" " " .	6 "	6 "	Ayrshire,	" " " "	3.86	9.97	13.83	86 17	0.69	-
" " .	" " " .	7 "	7 "	Native,	" " " "	4.21	10 71	14.92	85.08	0.71	4 samples, 14.53.
" " .	Burlington, (Middlesex county)	8 years,	6 "	Durham, .	6 qts. shorts, 4 qts. meal, hay and rowen,	4.82	10.46	15.28	84.72	.72	-
" " .	" " " .	7 "	6 "	Ayrshire, .	" "	4.58	9.80	14.38	85.62	.68	-
" " .	" " " .	8 "	6 "	Mixed, .	" "	1.88	9.83	11.71	88.29	.58	-
" " .	" " " .	12 "	1 "	Devon, .	" "	2.68	10.55	13.23	86.77	.66	-
" " .	" " " .	6 "	5 "	Ayrshire and Durham,	" "	4.02	11.20	15.22	84.78	.71	-
" " .	" " " .	8 "	2 "	Durham, .	" "	3.08	9.19	12.27	87.73	.63	-
" " .	" " " .	6 "	4 "	Ayrshire, .	" "	3.28	10.48	13.76	86.24	.65	-
" " .	" " " .	7 "	4 "	Ayrshire and Durham,	" "	4.31	10.64	14 95	85.05	.72	-
" " .	" " " .	7 "	4 "	Mixed .	" "	3.84	9.88	13.72	86.28	.69	-
" " .	" " " .	10 "	1¼ "	Part Durham,	" "	3.63	9.37	13.00	87.00	.66	10 samples, 13.75
Nov. (5 P. M.) .	Westboro' (Worcester county)	6 "	4 "	Durham, .	Hay, corn-fodder, shorts, ginten and corn meal,	2.55	8.59	11.14	88.86	.52	-
" " .	" " " .	2 "	4 "	"	" "	2.53	9.67	12.20	87.80	.73	-

TABLE No. 1 — *Concluded.*

TIME OF DAY AND YEAR.	Where Obtained.	Age of Cow.	Time since Calving.	Breed.	Character of Feed.	Fat.	Solids, not Fat.	Total Solids.	Water.	Ash.	Dairy Averages.
1885.											
Nov. (5 P. M.), .	Westboro' (Worcester Co.),	2 years.	5 days,	Durham, .	Hay, corn-fodder, shorts, gluten and corn meal,	2.74	9.55	12.39	87.61	.73	–
" " .	" " " .	2 "	2 months,	"	" "	2.88	9.35	12.23	87.77	.79	–
" " .	" " " .	4 "	4 "	"	" "	3.02	10.52	13.54	86.46	62	–
" " .	" " " .	2 "	3 "	"	" "	3.74	10.92	14.66	85.34	.79	–
" " .	" " " .	10 "	6 "	"	" "	3.84	9.82	13.66	86.34	.70	–
" " .	" " " .	8 "	5 "	Ayrshire and Durham,	" "	3.77	9.98	13.75	86 25	.83	–
" " .	" " " .	7 "	13 "	Durham, .	" "	3.32	10.39	13.71	86.29	.85	–
" " .	" " " .	2 "	4 "	Grade, .	" "	3.45	10.69	14 14	85.86	.68	–
" " .	" " " .	14 "	2 "	Durham and Holstein,	" "	3.22	9.42	12.64	87.36	.68	–
" " .	" " " .	4 "	4 "	Durham, .	" "	3.	9.79	12.79	87.21	.79	–
" " .	" " " .	4 "	1 "	"	" "	2.66	9.	11.66	88.34	.84	–
" " .	" " " .	12 "	5 "	"	" "	3.19	10.29	13.48	86.52	.78	14 samples, 13.00
" (5.30 P. M.),	Lincoln (Middlesex Co.),	8 "	3 "	Dutch, .	Shorts, meal and middlings, .	2.62	9 96	12.58	87.42	.64	1 sample, 12.58
" (4 P. M.), .	" " " .	8 "	2 "	Ayrshire, .	Sprouts, meal and middlings,	2.66	9.11	11.77	88.23	.54	–
" " .	" " " .	6 "	4 "	Dutch, .	" "	2.67	8.90	11.57	88.43	.56	2 samples, 11.67

" (5.15 P. M.),	"	"	"	8 "	6 "	Durham and Ayrshire,	Shorts, meal and middlings,	4.48	10.72	15.21	84.79	.62	1 sample, 15.21
Dec. (5 30 P. M.),	Weston (Middlesex Co.),			5 "	12 "	Native,	A mixture of 5 parts of corn-meal and 4 parts of malt sprouts, 10 qts. per day to each cow, with hay and oat straw,	5.79	10.56	16.35	83.65	.67	-
" "	"	"	"	7 "	3 "	"	" "	4.03	9.93	13.96	86.04	.60	-
" "	"	"	"	7 "	10 "	"	" "	4.32	9.99	14.31	85.69	.53	-
" "	"	"	"	6 "	12 "	"	" "	5.19	10.66	15.85	84.15	.64	-
" "	"	"	"	5 "	3 "	"	" "	3.92	9.82	13.74	86.26	.59	-
" "	"	"	"	5 "	7 "	"	" "	6.03	9.69	15.72	84.28	.63	-
" "	"	"	"	12 "	3 "	"	" "	4.42	9.76	14.18	85.82	.54	7 samples, 14.87
1886. Jan. (5 A. M.)	Amherst (Hampshire Co.			7 "	12 "	Short Horn,	6 qts. cob meal, head oats, corn-fodder and hay,	5.	-	14.10	85.90	-	-
" "	"	"	"	7 "	$3\frac{1}{2}$ "	Dutch,	" "	4.07	-	13.12	86.88	-	-
" "	"	"	"	7 "	3 "	Native,	" "	4.34	-	13.74	86.26	-	-
" "	"	"	"	$2\frac{1}{2}$ "	$2\frac{1}{2}$ "	Jersey,	" "	6.74	-	16.70	83.30	-	-
" "	"	"	"	5 "	5 "	"	" "	5.67	-	14.83	85.17	-	5 samples, 14.50

Average of single samples from private farms, . 13.43

Table 2. — *Mixed, or Herd Milk.*

PUBLIC INSTITUTIONS.

Time of Year.	Where Obtained.	Number of Animals.	Breed.	Character of Feed.	Fat.	Solids, not Fat.	Total Solids.	Water.	Ash.	
May, 1884, . .	State Institution No. 2, . .	5 cows, .	–	Ensilage, shorts, and cotton-seed meal,	4.02	9.16	13.18	86 82	0.66	–
" " . .	" "	–	–	" " " "	3 57	9.19	12.76	87.24	0.71	–
" " . .	" "	–	–	" " " "	3.56	8.54	12.10	87.90	0.68	–
November, 1884,	State Institution No. 1, .	15 cows, .	–	Each cow received 2 qts. corn meal, 4 qts. shorts, 2 qts. cotton-seed meal, about a bushel of ensilage and good English hay,	4.37	9.37	13.74	86.26	0.65	–
October, 1884, .	State Institution No. 3, . .	11 " .	–	Cut hay, corn meal and shorts,	2.76	9.80	12.56	87.44	0.75	–
" " .	" "	4 " .	–	" " " " " .	2.88	10.22	13.10	86.90	0.65	–
September, 1885,	State Institution No. 7, .	2 " .	–	4 qts. meal and pasturage, . .	3.86	10.31	14.17	85.83	0.67	–
August, 1884, .	State Institution No. 6, . .	4 to 8 cows.	–	Meal, grass and corn-fodder, . .	2.50	–	12.20	87.80	–	–
" " .	" "	" "	–	" " " " . .	2.90	–	12.30	87.70	–	–
	Total, . .	59 cows.						Average, . .		12.92

TABLE No. 2 — *Mixed Milk. Private Farms and Dairies.*

TIME OF DAY AND YEAR.	Where Produced.	Number of Cows.	Breed.	Character of Feed.	Fat.	Solids, not Fat.	Total Solids.	Water.	Ash.	
1884.										
August, . .	Lawrence (Essex County), private farm,	5	Native, .	Hay, meal, brewers' grains, .	2.76	9.59	12.35	87.65	0.66	–
" . . .	" " "	5	" .	" " " .	2.33	10.22	12.55	87.45	0.65	–
" . . .	" " "	5	" .	" " " .	2.74	10.04	12 78	87.22	0.69	–
" . . .	Andover (Essex County), private farm,	6	" .	Meal, hay, shorts, grass, . .	2.32	9.92	12.24	87.76	0.65	–
" . . .	" " "	6	" .	" " " .	2.61	9.39	12.00	88.00	0.61	–
" . . .	" " "	6	" .	" " " .	2.95	9.97	12-92	87.08	0.71	–
" . . .	" " "	6	" .	" " " .	2.60	9.95	12.55	87.45	0 65	–
November, . .	Lowell (Middlesex County), private farm,	16	Durham, from Ohio	Rye-meal, cotton-seed meal, shorts and cabbage leaves,	3 06	9.26	12.32	87.68	0.59	–
" . .	" " "	17	Natives, .	" " " .	3.58	9.40	12.98	87 02	0.60	–
" . .	Taunton (Bristol County), private farm,	17	Mixture, .	– – –	4.79	10.15	14.94	85.06	0.64	–
" . .	From a "swill-milk" farm, near Boston (Middlesex County),	2 1 sick.	–	Brewers' grains and swill (chiefly tomato skins and cauliflower stumps), with a little meal and salt hay,	3.55	9.65	13.20	86.80	–	–
" . .	" " "	2	–	" " "	3.10	11.18	14.28	85.72	–	–
1885.										
Sept. (5.30 A.M.), .	Littleton (Middlesex County),	6	–	Shorts and middlings and pasturage,	4.06	10.44	14.50	85.50	0.62	–
Oct. (5.00 P.M.), .	Woburn " "	6	Native, .	Shorts, cotton-seed meal and hay,	4.18	10.37	14.55	85.45	0.71	–

TABLE No. 2 — *Concluded.*

TIME OF DAY AND YEAR.	Where Produced.	Number of Cows.	Breed.	Character of Feed	Fat.	Solids, not Fats.	Total Solids.	Water.	Ash.	
1885.										
Oct. (5.00 P.M), .	Burlington (Middlesex Co.), .	20	–	6 qts. shorts, 4 qts. meal, hay and rowen.	3.35	9.96	13.31	86.69	0.60	–
" (A.M.), .	" " "	30	Mostly natives,	" " "	3.13	9.93	13.06	86.94	0.56	–
Nov. (P.M.), .	Westboro' (Worcester County)	2	Jersey, .	Hay, corn fodder, gluten, shorts and corn meal,	4.10	9.56	13.66	86.34	0.80	–
" " .	" " "	2	Holstein, .	" " "	2.56	9.13	11.69	88.31	0 61	–
" (4.00 P M.), .	Lincoln (Middlesex County),	3	–	Sprouts, meal and middlings, .	3.42	9.65	13.07	86 93	0.59	–
" (4.00 " .	" " "	3	–	" " " .	3.33	9.90	13.23	86.77	0.61	–
" (5.00 " .	" " "	3	–	Shorts, meal and middlings, .	3 62	10.56	14.18	85.82	0.72	–
" (5.15 " .	" " "	2	–	" " " .	4.57	10.57	15.14	84.86	0.62	–
" (5.30 " .	" " "	10	–	" " " .	3.11	10.39	13.50	86.50	0.64	–
" (5.30 " .	" " "	5	–	" " " .	3.38	10.04	1 .42	86.58	0.61	–
" (5.30 " .	" " "	5	–	" " " .	4.48	9.65	14.13	85 87	0.67	–
" (5.30 " .	" " "	18	Dutch, .	" " " .	3.21	9.43	12.64	87.36	0.58	–
" (6.00 " .	" " "	28	–	" " " .	3.39	10.37	13.76	86.24	0 61	
" (6.00 " .	" " "	9	–	" " " .	4.1	10.11	14.26	85.74	0.68	–
" (3.45 " .	South Lincoln (Middlesex County),	7	–	Meal, sprouts and corn fodder, .	–	–	13.30	86.70	0.60	–
" (4.00 " .	Lincoln (Middlesex County),	4	–	Meal and shorts, ...	–	–	14.31	85 69	0.61	–

" (4.20 " .	" " "	6	–	Meal, sprouts and corn fodder, .	–	–	14.91	85.09	0.62	–
" (5.00 " .	Concord, " "	4	–	Shorts, meal and rowen, . .	–	–	12.39	87.61	0 56	–
" (5.30 " .	" " "	4	–	Meal, corn fodder and cotton-seed meal,	–	–	14.91	85.09	0.66	–
" (5.30 " .	" " "	4	–	Rye, meal, corn and turnip-tops,	–	–	13.45	86.55	0 62	–
" (5.40 " .	" " "	4	–	Meal and brewers' grains, . .	–	–	13.07	86.93	0.61	–
" (5.50 " .	" " "	5	–	Shorts and meal, ...	–	–	14.01	85.99	0.61	–
" (6.10 " .	" " "	4	–	Shorts and meal, ...	–	–	12.68	87.32	0.63	–
1885.										
Nov. (6.15 P. M. .	Concord (Middlesex County),	5	–	Shorts, meal and corn, . . .	–	–	13.03	86.97	0.67	–
" (6 20 " .	" " "	3	–	Gluten meal and shorts, . .	–	–	12.55	87.45	0.65	–
" (6.30 " .	" " "	9	–	Meal and middlings, . . .	–	–	14.26	85.74	0.69	–
" (7.00 " .	" " "	6	–	Sprouts and meal, ...	–	–	13 42	86.58	0.71	–
" (7.00 " .	" " "	6	–	Meal, shorts and cotton-seed meal,	–	–	12.64	87.36	0.60	–
" (7.00 " .	" " "	7	–	Gluten, ...	–	–	13.22	86.78	0.68	–
" (7.00 " .	" " "	6	–	Meal and shorts, ...	–	–	12.77	87.23	0.60	–
1886.										
Jan. (7.00 " .	Amherst (Hampshire County),	4	–	Cob meal, oats, corn fodder and hay,	5.76	9.69	15.45	84.55	–	–
							Average, .			13.35

Table III.

Quality of milk (samples from individual animals), compared with the State standard — 13 per cent. solids.

SOURCE OF SINGLE SAMPLES.	ABOVE STANDARD.	PER CENT.	BELOW STANDARD.	PER CENT.
Public Institutions, .	54	46+	62	53+
Private Farms, . . .	55	59+	38	40+
	109	52+	100	47+
			109	
			209 Animals.	

Table IV. — *Milk of different Breeds.*

NATIVES.

Time of Day and Year.	Age.	Time Since Calving.	FEED.	Fat.	Solids, not Fat.	Total Solids.
June, .	Yrs. 9	6 weeks,	Ensilage and hay, ...	4.37	8.53	12.90
Oct., . .	–	6 mos.,	Cut hay, corn meal and shorts, . . .	3.08	8.98	12.06
" . .	–	–	" " . . .	3.81	9.96	13.77
Sept., P. M.	10	6 "	Pasturage and meal, ...	3.83	10.60	14.43
"	12	4 "	" "	3.87	10.52	14.39
"	6	3 "	" "	3.10	10.14	13.24
"	7	3 "	" "	2.21	10.25	12.46
Nov., P. M.	4	3 "	Hay, shorts and meal, ...	3.50	8.75	12.05
"	4	3 weeks,	" "	3.58	9.19	12.77
"	4	3 "	" "	3.14	9.15	12.29
"	5	2 "	" "	3.23	9.46	12.69
"	6	3 "	" "	1.92	9.03	10.95
"	3	6 mos.,	" "	4.07	9.24	13.31
"	5	5 "	" "	3.10	9.56	12.66
Nov., . .	7	–	Rye meal, cotton-seed meal, shorts and cabbage leaves,	4.10	9 60	13.70
" . .	9	–	" "	3.24	9.09	12.33
" . .	7	–	" "	2.73	11.04	13.77

MASSACHUSETTS

TABLE IV. — *Continued.*

Time of Day and Year.	Age.	Time Since Calving.	FEED.	Fat.	Solids, not Fat.	Total Solids.
Nov., . .	5	–	Rye meal, cotton-seed meal, shorts and cabbage leaves,	3.76	9.69	13.45
" . .	7	–	" "	3.90	10.04	13.94
" . .	7	–	" "	4.64	9.25	13.89
Oct., P. M.	3	6 mos.,	Hay, shorts and cotton-seed meal, . .	3.98	10.93	14.91
"	8	8 "	" " . . .	4.24	10.22	14.46
"	7	7 "	" " . . .	4.21	10.71	14.92
Dec., P. M.	5	12 "	Corn, meal, sprouts, swale-hay and oat straw,	5.79	10.56	16.35
"	7	3 "	" " . .	4.03	9.93	13.96
"	7	10 "	" " . .	4.32	9.99	14.31
"	6	12 "	" " . .	5.19	10.66	15.85
"	5	3 "	" " . .	3.92	9.82	13.74
"	5	7 "	" " . .	6.03	9.69	15.72
"	12	3 "	" " . .	4.42	9.76	14.18
Jan., A. M.	7	3 "	Cob meal, head oats, corn fodder and hay, .	4.34	–	13.74

MIXED MILK.

Time of Day and Year.		FEED.	Fat.	Solids, not Fat.	Total Solids.
Aug , 1884.	5 cows, . . .	Hay, meal, brewers' grains, ...	2.76	9.59	12.35
"	" "	" "	2.33	10.22	12.55
"	" "	" "	2.74	10.04	12.78
"	6 cows, . . .	Meal, hay, shorts and grass, . . .	2.32	9.92	12.24
"	" "	" "	2.61	9.39	12.00
"	" "	" "	2.95	9.97	12.92
"	" "	" "	2.60	9.95	12.55
Nov., . .	17 cows, . . .	Rye meal, cotton-seed meal, shorts and cabbage leaves,	3.58	9.40	12.98
" . . .	6 cows, . . .	Shorts, cotton-seed meal and hay, . .	4.18	10.37	14.55
		Average, ...	3.31	9.77	13.09

TABLE IV. — *Continued.*

AYRSHIRE.

Time of Day and Year.	Age.	Time Since Calving	FEED.	Fat.	Solids, not Fat.	Total Solids.
	Yrs.					
Oct., . .	–	3 mos.,	Cut hay, corn meal and shorts, . . .	3.01	8.84	11.85
Nov., . .	8	5 "	Shorts and hay, ...	3.02	9.50	12.52
May, A. M.	13	1 "	" "	4 92	–	11 66
"	2	4 "	" "	2.57	–	13.04
"	5	1 "	" "	3.14	–	14.63
"	4	1 "	" "	4.01	–	13.38
June, A. M.	2	5 "	Shorts, hay and grass, ...	3.58	–	12.68
"	13	1 "	" "	2.86	–	11.53
"	5	1 "	" "	4.00	–	13.40
"	4	1 "	" "	3.22	–	12.21
Nov., A. M.	10	6 "	Hay, shorts, meal and roots, . . .	4.49	10.71	15 20
"	3	3 "	" " . . .	2.71	9.31	12.02
"	16	24 "	" " . . .	3.00	9.85	12.85
"	14	8 "	" " . . .	3.51	9.92	13.43
"	9	3 "	" " . . .	2 89	8.37	11.26
"	16	12 "	" " . . .	2.80	9.08	11.88
"	7	2 "	" " . . .	2.44	9.67	12.11
"	12	10 "	" " . . .	2.20	9.21	11.41
"	10	3 "	" " . . .	3.07	9.31	12.38
"	3	4 "	" " . . .	3.09	9.66	12.75
"	3	3 "	" " . . .	2.83	8.84	11.67
Sept., A. M.	6	4½ "	Shorts, gluten meal and pasturage, . .	3.22	9.67	12.89
"	4	7½ "	" " . .	4.13	11.24	15.37
"	6	5½ "	" " . .	2.73	10.28	13.01
"	4	11 weeks,	Shorts and middlings, ...	5.04	10.63	15.67
"	6	6½ mos.,	" . "	3.83	10.78	14.61
Oct. P. M.	6	6 "	Hay, shorts and cotton-seed meal, . .	3.86	9.97	13.83
"	7	6 "	Shorts, meal, hay and rowen, . . .	4.58	9.80	14.38
"	6	4 "	" " . . .	3.28	10.48	13.76
Nov. P. M.	8	2 "	Sprouts, meal and middlings, . . .	2.66	9.11	11.77
			Average, ...	3.35	9.73	12.97

TABLE IV. — *Continued.*

DURHAM.

Time of Day and Year.	Age.	Time since Calving.	FEED.	Fat.	Solids, not Fat.	Total Solids.
	Yrs.					
May, . .	8	4 mos.,	Ensilage, shorts and cotton-seed meal, .	3.71	8.11	11.88
" . .	7	3 "	" " . .	4.16	8.66	12.82
" . .	8	4 "	" " . .	3.36	8.72	12.08
" . .	7	3 "	" " . .	4.92	8.44	13.36
" . .	7	18 "	Ensilage and hay, ...	3.36	8.74	12.10
Oct., . .	–	2 "	Hay, corn meal and shorts, ...	4.39	11.28	15.67
Nov., . .	9	4 "	Shorts and hay, ...	2.80	9.04	11.84
" . .	8	6 "	" "	3.67	9.92	13.59
" . .	9	6 "	" "	2.88	9.69	12.57
" . .	7	6 "	" "	2 76	9.56	12.32
" . .	9	3 "	" "	4.02	9.37	13.39
" . .	8	6 "	" "	3.11	9.16	12.27
Aug., P. M.	4	2½ "	3 qts. meal, grass and corn fodder, . .	3 28	8.85	12.13
Sept., P. M.	10	7 "	4 qts. meal and pasturage, ...	4.06	10.11	14.17
Nov., . .	5	–	1 qt. rye meal, 2 qts. cotton-seed meal, 3 qts. shorts and cabbage leaves,	2.60	9.40	12.00
" . .	5	–	" "	3.29	9.27	12.56
" . .	8	–	" "	2.80	8.45	11.25
" . .	7	–	" "	5.00	9.21	14.21
" . .	8	–	" "	2.69	8.99	11.68
" . .	5	–	" "	2.64	9.57	12.21
" . .	6	–	" "	3.01	9.45	12.46
Sept., A. M.	5	7 days,	Shorts and middlings, ...	4.54	11.77	16.31
Oct., P. M.	8	6 mos.,	6 qts. shorts, 4 qts. meal, hay and rowen, .	4.82	10.46	15.28
"	8	2 "	" " .	3.08	9.19	12.27
Nov., P. M.	6	4 "	Hay, corn fodder, shorts, gluten and corn meal,	2.55	8.59	11.14
"	2	4 "	" " .	2.53	9.67	12.20
"	2	5 days,	" "	2.74	9.55	12.39
"	2	2 mos.,	" "	2.88	9.35	12.23
"	4	4 "	" "	3.02	10.52	13.54
"	2	3 "	" "	3.74	10.92	14.66
"	10	6 "	" "	3 84	9.82	13.66
"	7	13 "	" "	3.32	10.39	13.71
"	4	4 "	" "	3.00	9.79	12.79
"	4	1 "	" "	2.66	9.00	11.66
"	12	5 "	" "	3.19	10.29	13.48

TABLE IV. — *Continued.*

MIXED MILK.

Time of Day.		FEED.	Fat.	Solids, not Fat.	Total Solids.
Nov., . .	16 cows, . . .	Rye meal, cotton-seed meal, shorts and cabbage leaves,	3.06	9.26	12.32
		Average, ...	3.28	9.44	12.73

HOLSTEIN.

Time of Day and Year.	Age.	Time Since Calving.	FEED.	Fat.	Solids, not Fat.	Total Solids.
	Yrs.					
May, . .	5	5 mos.,	Hay, shorts and cotton-seed meal, . .	3.56	9.10	12.66
" . .	5	6 weeks,	" " . . .	3.39	8.05	11.44
" . .	5	3½ mos.,	" and ensilage, . . .	4.07	9.01	13.08
" . .	5	5 "	"	3.68	9.26	12.94
" . .	5	6 weeks,	"	3.61	8.80	12.41
" . .	5	3½ mos.,	" and ensilage, . . .	4.56	9.09	13.65
" . .	5	12 weeks,	Ensilage and hay, ...	2.93	8.74	11.67
" . .	5	17 "	" "	4 36	8.02	12.38
" . .	7	15 "	" "	3.55	8 93	12.48
Oct., . .	-	19 mos.,	Cut hay, corn meal and shorts, . . .	4.77	10.58	15.35
Nov, . .	5	6 "	Shorts and hay, ...	4.67	10.25	14.92
" . .	7	12 "	" "	3.90	8.40	12.30
" . .	2	6 "	" and meal, ...	1.87	9.02	10.89
Aug., . .	3	4 "	Middlings, shorts, corn stalks and green oats,	-	-	12.20
" . .	2	5 "	" "	3 43	8.92	12.35
" . .	2	4 "	" "	2.33	9.49	11.82
" . .	2	4 "	" "	1.96	8.38	10.34
" . .	2	5½ "	" "	3.13	9.64	12.67
" . .	2	3 "	" "	2.39	9.75	12.14
" . .	6	3 "	" "	3.27	8.67	11.94
" . .	3	2½ "	" "	3.46	9.09	12.55
Aug., A. M.	10	4½ "	Pasturage, ...	3.36	8.73	12.09
"	4	4 "	"	3.26	8.93	12.19
"	5	4 "	"	3.70	9.35	13.05
Nov., P. M.	8	3 "	Shorts, meal and middlings, . . .	2.62	9.96	12.58
"	6	4 "	Sprouts, " "	2.67	8.90	11.57
Jan., A. M.	7	3½ "	Cob meal, head oats, corn fodder and hay,	4.07	-	13.12

TABLE IV. — *Continued.*

MIXED MILK.

Time of Day and Year.		FEED.	Fat.	Solids, not Fat.	Total Solids.
Nov., P. M.	2 cows, . . .	Hay, corn fodder, gluten, shorts and corn meal,	2.56	9.13	11.69
"	18 cows, . . .	Shorts, meal and middlings, . . .	3.21	9.43	12.64
		Average, ...	3.29	9.22	12.51

JERSEY AND ALDERNEY.

Time of Day and Year.	Age.	Time since Calving.	FEED.	Fat	Solids, not Fat.	Total Solids.
	Yrs.					
Nov., . .	7	–	Corn meal, shorts, cotton-seed meal, ensilage and English hay,	5.24	9.90	15.14
Oct., . .	–	3½ weeks,	Cut hay, corn meal and shorts, . . .	2.05	10.43	12 48
" . .	–	6 mos.,	" " " . . .	1.24	9.80	11.04
Nov., P. M.	5	6 "	Hay, shorts, meal and roots, . . .	3.97	9.53	13.50
"	8	6 "	" " . . .	4.08	9.89	13.97
"	10	3 "	" " . . .	4.36	9.65	14.01
April, . .	–	–	– – – –	6.25	9.01	15.29
Jan., . .	2½	2½ mos.,	Cob meal, head oats, corn fodder and hay,	6.74	–	16.70
"	5	5 "	" "	5.67	–	14.83

MIXED MILK.

Time of Day and Year.		FEED.	Fat.	Solids, not Fat.	Total Solids.
Nov., . .	2 cows, . .	Hay, corn fodder, shorts, gluten and corn meal,	4.10	9.56	13.66
		Average, ...	4.34	9.70	14.02

TABLE IV. — *Concluded.*

SUMMARY.

Number of Cows.	BREED.	Fat.	Solids, not Fat.	Total Solids.
11	Jersey,	4.34	9.70	14.02
93	Native,	3.31	9.77	13.09
30	Ayrshire,	3 35	9.73	12.97
51	Durham,	3.28	9.44	12.73
47	Holstein,	3.29	9.22	12.51